

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
REGION 5
OFFICE OF REGIONAL COUNSEL
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Date: December 8, 2000

FAX Recipient: Bob Berg
MPCA

FAX Number: (651) 296-8717

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U.S. EPA, Region 5

My Phone: (312) 886-6237

My FAX Number: (312) 886-0747

Subject: Metro

Pages: 22/32 + cover

September 28, 2000

Environmental Protection Agency
Region 5
77 West Jackson Boulevard
Chicago, IL
60604-3590

Re: Consent Decree, Civil Action No. 99-CV-1105

To Whom It May Concern:

The Minneapolis-St.Paul community is about to spend ~\$200 million for a new biosolids handling complex, including centrifuges, fluid bed incineration and chemical stabilization processes. This is a major expenditure by the people of this community. I believe that the fundamental engineering basis for demolition of the existing incineration system has been 'misrepresentative'.

The Consent Degree states that the Met Council shall comply with federal and state permits, rules, regulations, statutes, permits or orders. Two critical Minnesota State Statutes (attached) related to this project, concerning professional engineers are:

1. A licensee shall not engage: engage in conduct involving dishonesty, fraud, deceit, or misrepresentation.
2. A licensee who has knowledge or reasonable grounds for believing that another member of the professions has violated any statute or rule...shall have the duty of presenting such information to the board.

In December 1998, I wrote a memo "Suggestions on how to reduce odors, particulate, mercury & heavy metal emissions without new incinerators and cut the capital budget by \$125 to \$150 million". In the memorandum, I requested extensive quantitative information, to ensure that the existing complex was not being prematurely demolished. The response by the consultants in March 1999 was qualitative in nature. Many issues were clarified. However since then, I have found many reasons that the basis for demolition of the existing dewatering and incineration complex to be misrepresentative. Therefore, as required by State Statute and implied by the Consent Degree, I am presenting the information to State Board. A copy of the transmittal letter to the State Board is attached. Only the State Board has been sent a copy of the complaint to ensure confidentiality and proper legal distribution during the complaint investigation. The complaint is lengthy (~31 pages) and extensively documented, with 38 attached memorandums because of the project complexity and cost. EPA verification of numerous issues within the complaint is requested. Also, requested is that the EPA review the complaint and all responses to the complaint, prior to any final approval of the project to ensure that there has been no misrepresentation of data and/or regulations.

Other Comments:

1. If the project proceeds as scheduled, the public health benefit/cost analysis of the Supplemental Project to install Dry Electrostatic Precipitators should be done before the project is constructed, not after. An analogy is that an engineer does structural bridge calculations before a bridge is built, not after. If it is found that the public health benefit/cost ratio from this Supplemental Project is negligible after it is built, then the rate payers will pay for a useless project. There will be no accountability in this project, if it is determined after the construction that there is no health benefit. The project cost should also include building costs and annual operation and maintenance costs.
2. The permanent derating of the incinerators to a weighted average of 2.8 dtph from the design tonnage of 3.4 dtph, represents a loss of about 1.1 incinerators. This represents the loss of tens of millions of dollars in capital equipment, which the federal, state and local ratepayers paid for.

As a staff engineer from 1983 to 1990 in the incineration area, the need for a larger ID fan motor was known, just after startup of the facilities. Simply, the ID fan motor would frequently 'dump' at high current alarm, causing a 4-hour delay in solids processing. The solution then was to lower the tonnage. Installation of 600+ Hp variable speed motor (\$100,000) will solve the problem. Three consultants recognized this by the early 1990's. Installation of a larger motor is cost effective, since Northern States Power will pay \$18,000 towards the installation because of electrical savings. The Metro Plant fixed speed fans operate at a negative 65 to 70 inch w.c. pressure. In comparison, the Seneca WWTP variable speed fan operates at a negative 20 to 25 inch w.c. pressure. If a consumer had a car that would go 50 mph, instead of 65 mph because an undersized fuel pump, they would have the fuel pump changed immediately. The Metro Plant incinerators have had undersized I.D. fan motors for 17 years.

The EPA should require the installation of correctly sized motors. Also, the manufacture should be retained to determine what needs to be done to achieve 3.4 dtph at 30% cake solids during routine operation. The total capacity of six incinerators at 3.4 dtph would be 490 dtpd. The capacity of the three fluid bed incinerators (3 at 105 dtpd) and the chemical stabilization (180 dtpd) would be 485 dtpd, so after spending ~\$200 million, there is hardly any change in total capacity.

The Met Council is getting a great bargain by installing the correctly sized motors. The EPA and State paid 90% of the construction costs in the early 1980's. Spending ~\$600,000 for properly sized motors to gain the capacity of ~1.1 incinerators is cheap, when the Met Council only had to pay 10% of construction costs in the 1980's.

3. There are 'reasonable grounds' that the economic and rehabilitation costs for the existing multiple hearth incinerators have been misrepresented in various engineering reports. All of these issues are detailed in my complaint to the State Board, as required by State Law. Briefly, I have the following comments why the existing \$100+ million dollar complex should not be demolished:
- There is no mass demolition of multiple hearth incinerators built in the late 1960's and 1970's, due to equipment age. St. Louis, Cleveland, Indianapolis, and Green Bay are regional treatment plants that are not demolishing their incinerators. The manufacture can provide references of multiple hearth incinerators still operating from the 1930's and 1940's. What should be evaluated is supplemental solids processing for the existing system.
 - The major concerns of the public expressed at the public meetings about air pollution from the incinerators can addressed without having to build a new solids handling complex. Odor reduction is easily accomplished by the installation of centrifuges to shutdown Zimpro. Idle chemical precipitation tanks (paid by for the EPA) can be utilized to precipitate mercury and heavy metals, similar to Duluth's award winning process. Steady state particulate emissions could be reduced to by the installation of the Venturi-Pak or wet electrostatic precipitators. Additional energy recovery could be achieved by the installation of an electrical generator within the facilities.
 - Wastewater treatment Plants with multiple hearth incinerators can be run in a cost effective and competitive manner. The 1995 Camp, Dresser and McKee Survey of Midwest Wastewater Treatment Plant Costs shows that low, competitive staffing rates and unit treatment costs for wastewater treatment plants with multiple hearth incineration (Cleveland and St. Louis) are achievable. Fluid bed incinerators are not required to be cost competitive in the industry.
 - The savings of a correctly done incinerator upgrade, (rather spending +\$200 Million for a new incineration & alkaline stabilization system) could be applied for more buses and park & ride lots, to reduce traffic congestion. The EPA knows this is the major source of air pollution in our cities. The Met Council does not sufficient funds for buses and must ask the State Government for funding.

I would like to thank the EPA for consideration of my comments and complaint to the Minnesota State Board of Engineering.

Sincerely,



Stephen Greenwood, P.E.
1111 Argyle
St. Paul, MN
55103

September 28, 2000
1111 Argyle
St. Paul, MN
55103

Board of Architecture, Engineering, Land Surveying,
Landscape Architectue, Geoscience and Interior Design

Re: Complaint Concerning "Metropolitan Wastewater Treatment Plant Solids Handling Project" & Federal Consent Degree (Civil Action No. 99-CV-1105)

To Whom It May Concern:

Attached is a complaint concerning the demolition of the existing Metropolitan Wastewater Treatment Plant sludge dewatering, incineration and heat recovery complex and construction of a new ~\$200 million dollar complex. I believe that there are 'reasonable grounds' that the fundamental engineering basis for demolition of the existing complex have been 'misrepresented', therefore this must be presented to the Board as required by State law. This complaint is complicated, difficult and lengthy because of the project cost, public health implications, state & federal air pollution laws and a Federal \$250,000 civil fine, which was issued concerning the project.

A current Federal Consent Degree (Civil Action No. 99-CV-1105) concerning the project, states in Section V – Compliance Responsibility 8.0 "This decree does not authorize Met to violate any statute, regulation, permit or order" (attached). Therefore, I have notified the EPA that I have filed a complaint to the Board (attached), as I believe that there are 'reasonable grounds' that data has been misrepresented concerning this project. Because of the numerous air quality issues that are related to the EPA in this complaint, I request that the EPA be directly involved in a complete review of the complaint.

The general procedure for filing a complaint is that the engineer whom the complaint is being filed against must be named. Because of this project has involved multiple engineering firms, engineering staff and non-engineers, it is impossible and unfair to name anyone individual. Teams of persons write many reports and evaluations, so it is impossible and unfair say who wrote or decided the item in question. This complaint is against a 'system' or 'bureaucracy', more than any single engineer.

I would like to thank the Board for taking the time to investigate and resolve the attached engineering issues.

Sincerely,

A handwritten signature in cursive script that reads "Stephen Greenwood".

Stephen Greenwood, P.E. 14538

Date: December 17, 1998
To: MWWTP Solids Facility Core Team
From: Stephen Greenwood *SG*
Subject: Suggestions on how to reduce odors, particulate, mercury & heavy metal emissions without new incinerators and cut the capital budget by \$125 to \$150 million

MWWTP Solids Processing Improvement Project Report – CH2MHILL
MWWTP Metro Solids Processing Improvement Project No. 970300

Summary

In 1983, four multiple hearth incinerators (MHI) were completely rehabilitated and two new ones were put in operation at a cost of over \$100 million, which are still operational. The Metro Solids Facility report states that there is incinerator capacity though the planning year of 2025 and that the incinerators are in "good condition." Therefore, it is critical to understand and validate what modifications are required for the existing multiple-hearth incinerators before demolition plans are finalized and \$187 million spent for a new facility. Several subtle, key assumptions need to be documented, verification of which are: 1) EPA requirements for the RHOX process (\$93 million); 2) usable life of an incineration facility; 3) O&M costs for running an older incineration system; and 4) other assumptions that are listed latter in this memo.

If RHOX (\$93 million) is not required by the EPA, then it may be more cost effect to upgrade the existing dewatering & incineration system than building a new complex at \$187 million. The major process upgrades required would be as follows: 1) installation of centrifuges (~\$10 million) to reduce odor & Zimpro costs (~\$3 million/yr.); 2) installation of Venturi-Pak (~\$1.4 million) to reduce particulate emissions; 3) reactivation of the physical-chemical treatment tanks (~\$2 to 5 million) to reduce mercury and heavy metal air emissions; 4) new 600 Hp variable-speed motors and water-cooling sprays (~\$1 million) to stabilize the incinerator and reduce emergency damper openings; and 5) say another \$15 to \$25 million for miscellaneous upgrades, (i.e. replace silencer, repair emergency damper, ash system, and hydraulic system).

If upgrading the existing dewatering and incineration system could be done for between \$30 and \$40 million, then this would result in substantial capital and interest cost reduction. These modifications should satisfy the neighbors' desires for odor reduction and environmentalist requests for reduced mercury emissions. Major savings on the order of \$125 to \$150 million would result from the proposed capital budget of \$187 million.

These capital cost savings could be used for: 1) covering the primary tanks, gravity tanks and aeration influent channels (these are major odor sources at the Metro Plant) and 2) mass transportation (transportation is the major carbon monoxide source in cities).

Detailed Comments

RHOX Alternative Upgrade

The report states, "The MP (Master Plan) did not include alternatives that would retrofit the existing multiple-hearth furnaces ... (with) cost-effective retrofit air pollution control technology that would meet or exceed the stringent EPA requirements....MCES received a proposal from RHOX Technologies.." (page 1 Appendix B)

There are multiple ways to upgrade incinerators, RHOX (\$93.6 Million) being only one. The RHOX alternative is a manufacturer's proposal and not a current EPA requirement. I called the EPA and asked if they are going to require RHOX in the future. They said they are now discussing various multiple-hearth incinerator modifications, which primarily is the installation of afterburners to reduce hydrocarbons. Metro Plant already has afterburners. EPA does not specify specific proprietary processes, such as RHOX. The RHOX process will reduce carbon monoxide to about 1 ppm; however, it is a 'piping nightmare.' A large capital expenditure to reduce incinerator carbon monoxide emissions does not make sense, when 78% to 95% of carbon monoxide emissions in cities are from transportation sources¹. At a cost of \$93 million, the benefit-cost ratio is not good. Spending \$93 million for mass transportation is a better way to reduce the cities' carbon monoxide levels, in my opinion. Also, RHOX is not designed for particulate removal, as is the Venturi-Pak alternative. The RHOX cost of \$93.6+ million clearly made the MHF incinerator rehabilitation alternative upgrade appear unreasonably costly.

An official letter from the EPA stating that RHOX or similar process to reduce carbon monoxide is required to verify multiple-hearth upgrade requirements. This is critical because the RHOX requirement is a \$93 million assumption that needs written, documented validation.

Incinerator Life, Condition and Operating Costs

The rationale for demolition of hundreds of millions of dollars of operable capital at the end of the "design life" is not adequate rationale (page 1-2) in my opinion. This philosophy needs to be confirmed in writing by the independent sources; such as, the incinerator manufacturer (BSP), Water Environment Federation or other municipal associations (AMSA).

One of the selling points for this project has been that the MHIs are old. Yet, there is no benchmarking evaluation of other municipal facilities or any detailed structural engineering evaluation with materials testing of the incinerators and/or off-gas system in any of three major reports (Master Plan, Incinerator ID Fan Improvement Project and MWWTP Solids Processing Improvement Project). On September 16, I called the original manufacturer of the existing incinerators (BSP) to find out about what tests are required to determine the structural condition of the incinerators. They said two tests were required:

1. Ultrasonic testing of the shell
2. Inspection of the brickwork from the inside.

Neither of these tests were conducted on Metro incinerators by the consultant or the in-house personnel, to the best of my knowledge. BSP still has the original engineering drawings and would be able to compare the existing conditions with the original conditions. I asked for a ballpark price quote

to determine the structural integrity of the incinerators. They said that \$10,000 to inspect two incinerators would be a budgetary price. If a second opinion is required, then they said Hankin Environmental Systems was qualified.

Also, I asked BSP what should be the life expectancy of a multiple hearth-incinerator? They said that when incinerators are properly operated and maintained, they should easily last 20+ years. They know and can provide references of incinerators that are still operating from the 1930's and 1940's.

Without an actual inspection, the condition and remaining life of the incinerators is merely speculative. The \$10,000 for a manufacturer's inspection of the incinerators is a small amount of money, considering the \$187 million project cost for a new system. The use of Senca's WWTP rehabilitation cost data could lead to misleading conclusions for any multiple-hearth upgrade, since there has been no documented structural inspection. No plans should be approved for rehabilitation or demolition of the incinerators (the major cost item for the project), without an inspection according to manufacturer's recommendations.

In my March 19 comments, I asked that the 'real life expectancy of an incinerator facility be verified', this was not addressed in the final report. Part of the justification for demolition of the existing system is that of subsystem reliability. This needs additional documentation. If this were true, then virtually every multiple-hearth incinerator facility in the country would be demolished. Metro's incinerators are some of the newest in the country, since four were rebuilt and two new ones were built in the early 1980's. As mentioned in my March 19 memo, St. Louis, Cleveland, Detroit & Indianapolis (privatized) have not immediate plans to demolish their incineration systems, which are as old if not older than Metro's. Also, as a local benchmarking example, one can look at NSP's power plants. The Alan King, High Bridge & Black Dog power plants are 30 to ~50 years old. The subsystems at power plants are no less complicated than at a sludge incinerator system. Did NSP demolish these power plants after 25 years because of 'design life' and 'subsystem reliability' issues?

The report states, "...However, continuing to maintain outdated equipment has led to increased operations and maintenance costs..." (p. 1-1). Quantitative documentation should be provided that show how much the costs are increasing since startup in 1983, because increasing costs due to aging might not be significant enough to justify building a complete new complex for \$187 million. For example, what if yearly O&M costs are increasing by \$100,000 per year? This would not be enough to justify a new complex. Also, examination of the 1995 CDM survey similarly sized Midwest treatment plants does not confirm the basic premise. For example, the two St. Louis WWTP's (with incineration) averaged \$182/million gallons treated. The Cleveland plants Easterly + Southerly (with Zimpro and incineration) averaged \$244/million gallons. Metro's cost was \$548/million gallons and its solids handling equipment was only about 13 years old at the time of the 1995 CDM survey and certainly not any older than Cleveland's or St. Louis's WWTP plants.

Interest Cost & Payback Period

The interest cost for \$187 million is not included, in the project cost summary. For a 20-year bond at 4%, the total project cost would then be about \$336,000,000, $\{S = P(1 + ni)\}$. If the MHFs and dewatering can be upgraded for ~\$35 million (with no RHGX), then the total project cost with interest would be \$67 million. This is a difference of \$269 million dollars between the upgrade cost and a new facility cost; therefore, accurate information is needed for the upgrade alternative.

It would take about \$13 million per year $\{(336-67)/20\}$ in O&M savings from the fluid-bed incinerators for 20 years to payback the project cost for the new fluid-bed incinerators, which is impossible to achieve. This is only a first-order analysis; and a more detailed, rigorous analysis is required. This was previously requested in my March 19 memo, but not discussed in the final report. It should be obvious that a new solids facility building (@ \$187 million) cannot be justified based on O&M cost savings from new incinerators. Essentially, it is now cheaper to keep the existing multiple-hearth incinerators in operation with the appropriate upgrades, than it is to build a new solids handling complex (\$187 million). Major cost cuts in the project will be needed to justify any new incinerator facility on a cost basis, compared to an upgrade cost.

The major O&M cost savings benefits are from the installation of the centrifuges (~\$10 million), which shuts down the costly and odorous Zimpro heat treatment process. This is what should be done immediately in 1999. Montgomery & Watson had estimated savings of about \$3 million per year from centrifuge installation, in 1992. The centrifuge installation has a payback on the order of 3.3 years, which is a reasonable payback period. On a national basis, centrifuges have now been installed in many major cities (New York, Chicago, L.A., Washington D.C., Paris, Vienna, Munich, etc.) and numerous other smaller cities. Centrifuges could have been completely installed by 1998. Various memo's were written since 1994, recommending that the centrifuge test schedule be modified so that the centrifuge test & installation could be completed by 1998. These recommendations were not approved by the DPAC and the consultants; instead, it has taken 4½ years to demonstrate centrifuge feasibility. This now results in significant added yearly O&M costs and odor emissions. Delaying centrifuge installation until 2004+ is not competitive in this industry.

Use of F&I 1

The use of F&I 1 for fluid-bed incinerators and increased processing capacity was made not feasible by the use of a long off-gas system. The details of that were discussed in a previous memo dated March 19, 1998. By not keeping the off-gas system to a reasonable length and size, the total project costs skyrocketed (to \$187 million) for having to build a new solids building, plus alkaline stabilization for peak weeks. Designing the off-gas system for mercury removal is not cost effective, when chemical precipitation tanks are available for mercury and heavy metal removal (see comments on mercury reduction below).

NIRO's preliminary drawings in 1993 showed two fluid-bed incinerators in a 60' by 60' area. These had heat recovery and wet electrostatic precipitator. Even adding 30' for a cyclone for dry ash removal, the required area could be 90' x 60' for two incinerators. Had the design of the fluid-bed incinerators been kept within F&I 1, the existing dewatering area and multiple-hearth incinerators project costs could have been substantially reduced. The report says that three incinerators could not be fit into the footprint of F&I 1. Letters from at least two incinerator manufacturers should be required to verify that three 'competitively sized' incinerators and off-gas system (with dry ash removal and that comply with proposed EPA regulations) cannot be fit into the footprint of F&I 1.

Incinerator Capacity

The report says that there is adequate capacity through the year 2025 (p. 8-1) and that 'increasing equipment failures jeopardize the plant's ability to meet projected peak loading conditions'. The quantitative data on increasing equipment failures should be included for review. If the problem is to

provide capacity for peak conditions, it is obvious that the existing incinerators should not be demolished, provided upgrades can be done at a reasonable cost and comply with EPA regulations.

There should be alternative ways to process sludge for peak conditions; rather than having to demolish everything and build a complete new system. The report should have commented on the following ways to handle peak conditions during incinerator downtime: 1) use of Seneca's N-VIRO and multiple-hearth incinerators, 2) use of future Blue Lake's Heat-Drying capacity, 3) installing one or two fluid-bed incinerators in the F&I 1 footprint, 4) installation of the alkaline stabilization facilities in the F&I 1 footprint and 5) the use of a private contractor to handle excess sludge during peak conditions.

ALTERNATIVE MULTIPLE-HEARTH UPGRADE SUMMARY - HOW TO REDUCE PARTICULATES, MERCURY, ODOR AND CAPITAL COSTS -

Particulate Emissions

To reduce particulate emissions by about 75% (~0.2 lb/DT), the Venturi-Pak could be installed. Particulate emissions from either the fluid-bed or multiple-hearth incinerator are a function of the scrubber system, not the incinerator, as presented at the public meetings in June 1998. The Venturi-Pak simply consists of a retrofit of the inside of the existing subcooler. No new floor space would be required. EnviroCare markets both the Venturi-Pak and wet electrostatic precipitators, so they know each process. They recommend the Venturi-Pak first, then the wet electrostatic precipitator second as a polishing unit. The manufacturer's budget cost is \$1.4 million to retrofit six incinerators at the Metro Plant. The manufacturer's quote, schematic and operating data are attached in Appendix A.

Venturi-Paks are now been proven in over 5 years of operation at Indianapolis. I called the Indianapolis wastewater plant to verify the reported emission data by EnviroCare and Indianapolis' daily operational control satisfaction. They confirmed the emission numbers that are in Appendix A and are pleased with its operation, since 1993.

The average particulate emission rate from 6 different tests at 3 different cities is 0.2 lb/DT. This compares to the Metro Plant average of about 0.8 lb/DT. The 0.2 lb/DT emission rate is substantially below the EPA limit of 1.3 lb/DT for total particulates and 1.2 lb/DT for particulates below 10 um. Another reported advantage with the Venturi-Pak is that it eliminated the yellow haze commonly seen at the stacks. This is reasonable, since the submicron particulate emissions are being reduced.

As an alternative to the Venturi-Pak, a traditional wet electrostatic precipitator could be evaluated and installed, to reduce particulate emissions, if that process is more cost effective.

Odor Reduction

Metro Plant odor emissions was one of the main topics at the public hearings and a petition from neighbors complaining about odor was submitted. To reduce plant odor, the remaining centrifuges should be immediately installed in 1999 to shut down Zimpro. The report correctly states that "Decommissioning the Zimpro heat-treatment process will eliminate one of the most dominant sources of odors currently in the plant." As an example, the Dubuque WWTP had Zimpro heat treatment with

fluid-bed incineration. Once they shut down Zimpro in 1994, the odor reduction was described by the plant manager² as "like the difference between night and day." Also, he estimated that shutting Zimpro down reduced his plant budget by at least 15%.

What should be evaluated for odor reduction is: 1) the installation of covers for the primary & gravity tanks (like Seneca) and 2) the immediate shutdown of Zimpro, as the primary means to reduce odor. These modifications would reduce odor more than new incinerators. This is in accordance with the past odor studies done by Malcolm-Pirnie.

At the public hearings on the incineration project, odor reduction benefits from the centrifuges were bundled with construction of the new incinerators. Frankly, I would have left the meetings believing that it was the new incinerators that would reduce the odor. There is no documentation provided in the report that proves fluid-bed incinerators will make any significant odor reduction. There were no odor tests conducted on the off-gases for the fluid-bed incinerator pilot test in early 1998 to verify any odor reduction associated with shutting down the existing multiple-hearth incinerators. In the last 17 years, I have never seen one independent journal article or study that evaluated the difference in odor emissions from a 'multiple-hearth incinerator with afterburners' and from a 'fluid-bed incinerator'.

Delaying the installation of the centrifuges until 2004, only prolongs the Zimpro odor problem, prolongs high yearly Zimpro O&M costs and greatly increases capital costs for a new dewatering & incineration building.

Mercury and Heavy Metal Reduction

To reduce mercury and heavy metal emissions, the rarely used physical-chemical treatment tanks should be tested and activated. The CH2MHILL report did not evaluate the use of chemical precipitation for mercury and heavy metal removal. Also, the public perception was given, at the meetings and in the papers, that new incinerators were needed to reduce mercury. Duluth has used chemical precipitation of scrubber water to reduce mercury emissions since the early 1990's. They have essentially the same wet scrubber system as Metro incinerators. In a 1992 trip to the Duluth WWTP, personnel reported that atmospheric mercury emissions were significantly reduced with chemical precipitation. This was done by the addition of lime and polymer to a 'portion' of their scrubber water and then dewatering the precipitate. The sludge cake is then landfilled. Removing heavy metals from the scrubber water prevents recycling to the head of the plant and eventual discharge to the atmosphere.

Chemical precipitation was pilot-tested by R&D personal in the late 1980's, using odor control scrubber water with high sulfide concentrations for the metal precipitation reaction. R&D personnel estimated about a 40% reduction in mercury would result with chemical precipitation. In 1992, I had proposed a one-month, full-scale test for metal precipitation based on R&D's pilot study evaluation. The full-scale process diagram, spreadsheet) is in Appendix B. The amount of scrubber water treated could be substantially reduced by using only a portion of the scrubber water, similar to Duluth, and still achieve substantial heavy metal reduction.

Fundamentally, all of the required major tankage and piping is available for chemical precipitation. Requirements would be: new dewatering mechanism (belt press), correctly sized chemical feed pumps, some new chemical storage tanks, cake loadout conveyors, and connecting piping from the scrubber effluent water to the P-Chem tanks. As a ballpark estimate, about \$2 to \$5 million would be required

to activate the physical chemical treatment tanks. This would be cheaper than installing new air pollution control technology and buildings for sludge incinerators to reduce mercury.

Since any process improvements to reduce mercury and heavy metal discharge to the atmosphere is currently voluntary by the Met Council, it should not matter what percent of the mercury or heavy metal reduction is achieved by chemical precipitation. If a higher level of mercury/heavy metal reduction is required than what could be achieved by chemical precipitation and source reduction, then a detailed environmental impact and public health analysis needs to be completed to justify the additional cost of new incinerators and scrubbers.

In the scrubber system that CH2MHILL is proposing (dry and wet ESP's, and wet scrubber) any mercury that would be removed will be in a liquid stream. Therefore, some form of chemical precipitation will be need; otherwise the mercury will recycle back to the head of the plant in the liquid stream, which is currently happening. The CH2MHILL report needs to be more detailed on how mercury is going to be removed from the incinerator gas stream and not be recycled back to the plant.

The use of both a wet and dry electrostatic precipitator for the off-gas train is unique. At least three references from major facilities that use both dry and wet electrostatic precipitators on an off-gas system are needed to verify that the proposed off-gas system is competitive, feasible and not over-designed.

Emergency Damper

The CH2MHILL report should include the following in the appendix on their evaluation of the emergency damper problem: reason for emergency bypass, frequency of occurrence, air leakage rates around the damper, estimated particulate emissions recommended corrected solutions, and EPA comments. These are needed so the problem can be discussed openly. It appears that the emergency damper situation is now being used, as one of the main justifications for construction of the new fluid-bed facilities, yet there is no engineering documentation in the report on this very critical aspect.

To reduce the amount of time until the emergency by-pass opens, a 600-hp motor and water cooling sprays should have been evaluated; and there appears to be no record of this in the report. These two items would cost about \$1 million for 6 incinerators.

Installation of a 600 Hp variable speed motor would reduce the frequency of dumping due to high current and also allow burning at design feed rates. This was evaluated in the late 1980's, but never implemented. Very simply, the TKDA design excess air rate was 125% excess air, but due to higher than anticipated leakage, the actual excess air is in the range of 150 to 200%. The average is about 185% excess air based on past particle test results. This extra leakage then creates a higher mass loading to the incinerator fan and motor. Thus, the design ID fan motor of 500 Hp is undersized, primarily due to air leakage. To prevent dumping due to high current and create the ability to easily operate at the design feed rates, the incinerator should have a 600 HP motor. A 600 Hp variable-speed motor and controls would cost about \$100,000. This is a small upgrade cost in order to achieve design incineration rates without operating at maximum amperage. A variable speed fan would also eliminate the second largest pressure drop across in the off- gas system (which is the ID fan damper) and, thus, reduce the pressurization problem in the incinerator.

Another means to help stabilize the incinerator during excursions is that of the use of water-cooling sprays. The use of water requires about 4 to 5 times less mass than air for cooling. A journal article is attached in Appendix C. The other advantage is that any water sprayed into the incinerator for cooling, will then condense in the wet scrubber. Thus, the ID fan motor has only a slight increase in mass loading when water sprays are turned on for supplemental cooling. Water sprays now have been installed in one incinerator at Seneca, since January, and data is available for review. The use of supplemental water for cooling will reduce the load on the ID fan motor during upset conditions, thus helping reduce the number of times the incinerator dumps due to high-current alarms and pressurization.

The problem of by-passes from the emergency damper should be considered a correctable problem, rather than justification for a complete new facility. The complete CH2MHILL analysis and test results of the problem should be attached in an Appendix.

Miscellaneous

In Section 8 – “Existing Solids Processing Facilities – Dewatering,” various concerns were given by plant staff about the present system (Page 8-5). All of the concerns would be gone if centrifuges were installed. Each concern will be addressed below:

- a. “... The loss conveyor 2B impacts four incinerators and/or three roll presses.” If a portion of the eight centrifuges (say 4) were installed in the plate and frame area and the other four were installed in the vacuum filter area, then there would be optimum flexibility of being able to use all of the belts in the dewatering area. The loss of 2 B would not be as great a problem.
- b. “... There is no mechanism to feed the dewatered solids back to the incinerators...” A load-in conveyor system was evaluated back in the mid-1980’s and was basically cut. This project could always be reactivated but really is not that essential.
- c. “...roll press rollate and vacuum filtrate pumps are in poor condition...and are subjected to a corrosive atmosphere.” If centrifuges were installed in the dewatering area, the existing plate and frame filtrate sump could be used, and the filtrate pumps are in an open area.
- d. “A second vacuum pump is required to improve vacuum filter system reliability.” Vacuum filter pumps are not needed with the centrifuges and roll presses installed.
- e. “... in 1994...two waste heat recovery boilers... were down for extended annual maintenance periods...” With centrifuges installed and Zimpro shutdown, the use of waste heat boilers becomes less critical.
- f. “...continuous replacement and repair of components and subsystems would make the system life appear to be unlimited...such a program does not recognize the end of useful life and results in excessive maintenance costs and system downtime.” In my memo dated March 19, 1998, I asked the following question “what are typical O&M costs for operating older multiple-hearth incinerators?” This question should have been answered in the report and was not. Please see my other comments on facility life.

SUMMARY OF REQUESTED DOCUMENTATION AND TESTS FROM CH2MHILL AND/OR CDM MASTER PLAN REPORT.

There are numerous justifications & statements in the report that need written documentation and verification, which are summarized below:

1. Written documentation from EPA officials that the RHOX process (\$93 Million) or a similar process will be required for multiple-hearth incinerators.
2. Structural inspection reports, done according to the manufacturer's (BSP Inc.) recommendations for the incinerators and off-gas system need to be included.
3. Independent, documented verification (from the incinerator manufacturer, WEF or AMSA) that multi-million dollar incinerator complexes should be demolished at the end of the engineers' "design life." Documentation that 21 years (2004-1983) is a competitive life span, not a minimum life for a 100+ million-dollar incineration complex.
4. Documentation that the reported increasing O&M costs due to aging equipment is sufficiently great enough to justify a complete new incineration complex. Documentation of O&M costs of older multiple hearth incinerator systems from other major Mid-west cities such as: Cleveland, Detroit, Indianapolis (United Water), and St. Louis, should be included.
- * 5. Written documentation from the EPA and/or MPCA that the following incineration and dewatering upgrade for the Metro plant is or is not acceptable: installation of centrifuges, Venturi-Paks, 600 Hp ID fan motors & incinerator water cooling sprays, repair/replacement of the emergency damper and activation of the physical-chemical treatment tanks for heavy metal removal. The detailed cost estimate for the multiple- hearth upgrade (without RHOX) needs to be included.
6. An estimated payback period for the installation of 3 new fluid-bed incinerators, separate from the centrifuge cost and savings needs to be calculated.
7. Interest costs must be included in the cost analysis, when comparing the multiple- hearth upgrade to a complete new incineration & dewatering building.
8. The details on emergency damper opening problem analysis (cause of opening, frequency of opening, solutions, evaluation of 600 Hp motor & water cooling sprays, leakage rates, costs, EPA comments, etc.) should be included.
9. The details on how mercury is removed from the flue gas stream needs to be discussed; and how is it going to be prevented from recycling back to the plant? The use of chemical precipitation for mercury reduction needs to be evaluated and included in the report.
10. Documentation on cost and public health risk justification for mercury removal processes beyond what can be achieved by source reduction and chemical precipitation (using P-Chem facilities) needs to be included.
11. Letters from at least two different fluid-bed incinerator manufacturers, stating that three fluid-bed incinerators (with dry ash removal & meeting EPA requirements) cannot be installed within the footprint of F&I 1.
12. A clear explanation of odor sources (primary tanks, gravity tanks, incinerators, etc.) and relative strengths from the Metro Plant, as described in previous odor studies, should be presented to the public and included in the Facility Plan.
13. At least three references from major facilities that use both dry and wet electrostatic precipitators on an off-gas system, to verify that the proposed off-gas system is competitive, feasible and not over-designed.
14. Alternative means to handle 2025 peak loading conditions need to be addressed; such as, Seneca's N-Viro process, future Blue Lake heat drying process, private contractor sludge disposal, installation of 1 new fluid-bed incinerator in F&I 1, use of sludge storage tanks, etc.

Written responses for each of the items listed above is expected (some which were previously requested); otherwise, the conclusions reached will be suspect and potentially misleading, for a project that could cost \$300+ million with interest. Responses should be completed and distributed in a separate attachment, prior to finalization by the Met Council of the Facility Plan for the new incineration & dewatering complex.

SG:car

cc: Solids Facility Team: J. Brown, D. Solberg

B. Pickart
J. Corcoran
B. Moore
R. Polta
J. Edwards
H. Boyer

Attachments

A:\STEVE\ALTSOLID.DOC

¹ EPA, 1996 National Air Quality and Emissions Trend Report

² Telephone conversation, Plant Manager, Debeque WWTP, December 12, 1995.

Appendix A

Venturi-Pak Information

EnviroCare

FAX TRANSMITTAL

EnviroCare**Systems**

27-M Commercial Blvd.
Novato, CA 94949 USA
Tel 415.883.3595
Fax 415.883.2655

Date: 4-3-98

Company: Metro
Attention: Steve Greenwood
From: Sid Howard

Fax Number: 612-602-1030
No. of Pages: 1

Subject: VenturiPak
Our No.: P-1432

Steve - A quick budget estimate is \$260,000 per unit and \$1,404,000 for six units. Price is based on using plant air. If the retrofits become of real interest, we would visit you for a site visit before preparing firm quotes.

With six units involved, we should:

- Review the possibility of having one central water station to strain (clean) and pressurize plant water for the venturi stage and the mist eliminator wash, rather than having separate facilities at each unit.
- Review the gas flow to the scrubber system. I think the values we are working with are high.
- Inspect the existing units to confirm size, space, and to identify any problems in access, etc.
- Consider the feasibility of gas circulation gas from the ID fan back to the scrubber inlet to provide a constant gas flow through the scrubber. Gas circulation, or drawing air through a port in the scrubber, can simplify the atomization controls and provide good scrubbing when the gas flow drops below 60% of design.
- Generate firm quotes on buyout components.
- Prepare a plan for the start-up and training required for all six units.
- Develop a work schedule
- Obtain a budget estimate of installation cost per the work required and the work schedule.

In short, there are cost savings available when six large units are involved.

Hope this is helpful.

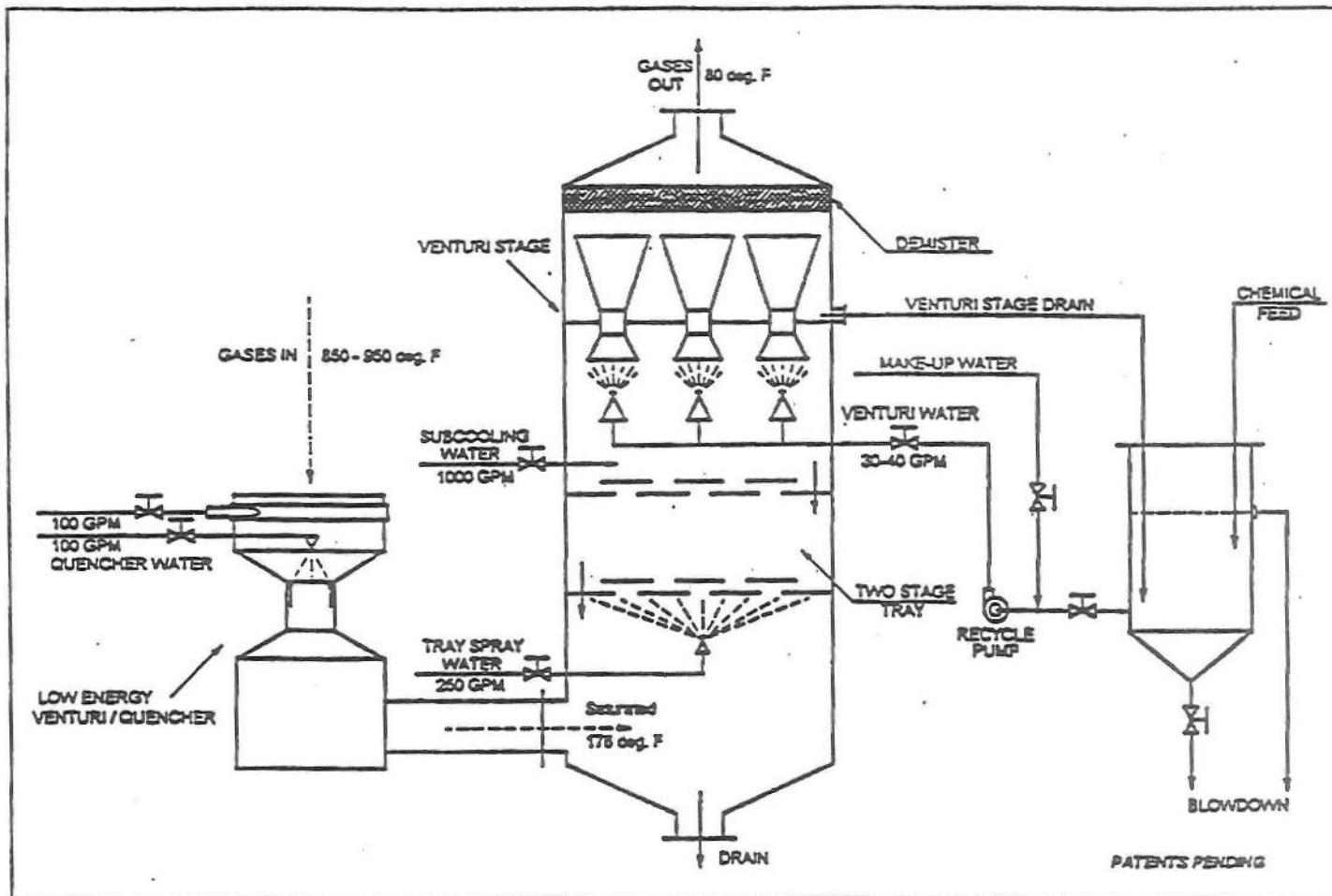
Sid

VenturiPak Data Summary

Site	No. Tests	$\approx \Delta p$	gr/dscf	lb/dt
Indianapolis	3 avg.	20	0.004	0.2
Indianapolis 2nd	1	25	0.003	0.11
Indianapolis 2nd	1	25	0.003	0.13
Canton	3 avg.	20	0.0065	0.3
Fitchburg	1	14+	0.005	0.26
Fitchburg	1	15	<u>0.0036</u>	<u>0.15</u>
AVERAGE =				0.2

METRO'S Average = ~ 0.8

EPA LIMIT = 1.3



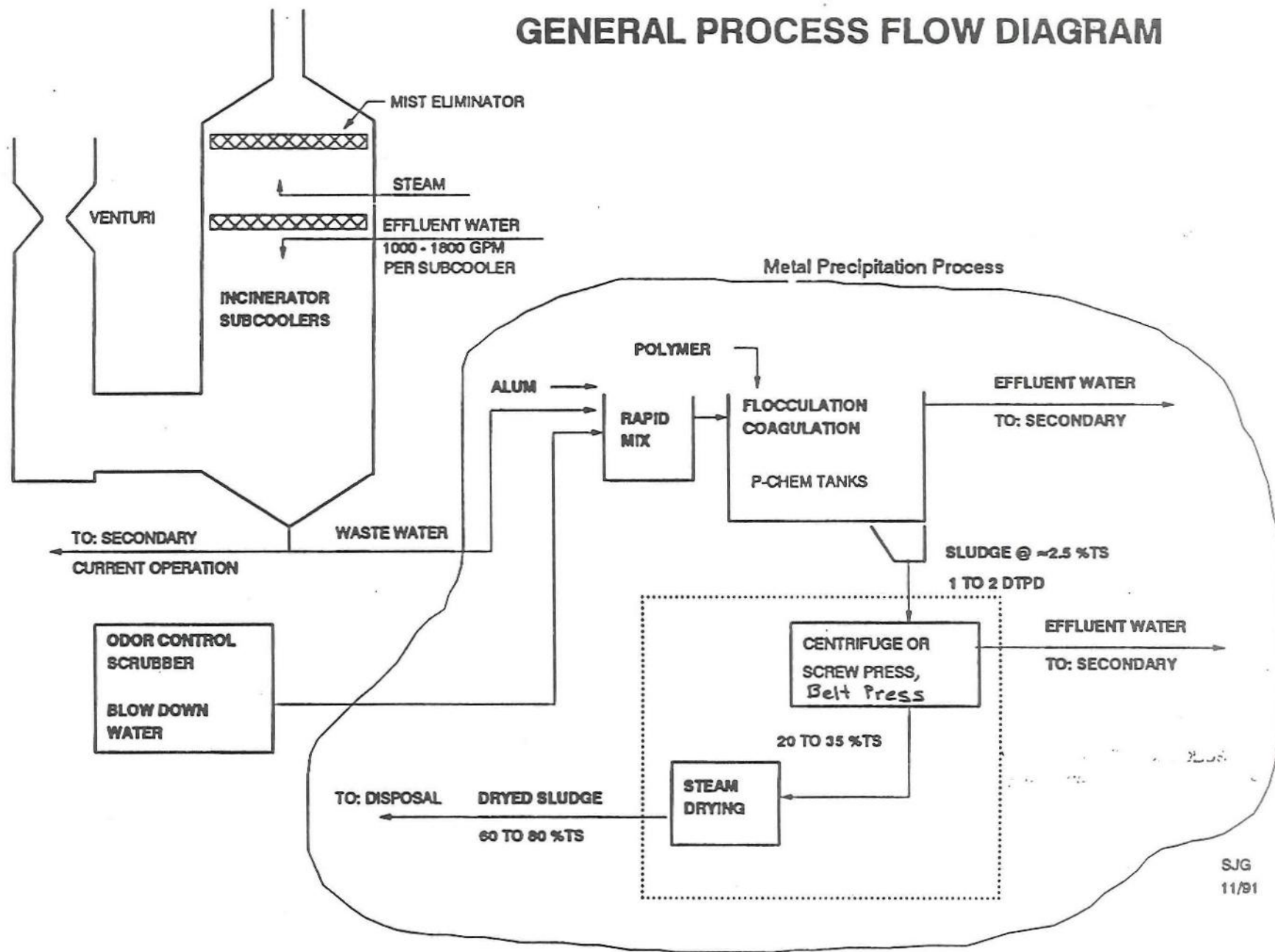
VenturiPak™ Scrubber System / City of Indianapolis
 DPW / AWT Facility – Recycle Process Flow Diagram
FIGURE 4

Appendix B

Chemical Precipitation

Process Data

STEAM INJECTION & METAL PRECIPITATION GENERAL PROCESS FLOW DIAGRAM



INCINERATOR SCRUBBER WATER METAL PRECIPITATION
PROCESS SPREADSHEET

SCRUBBER WATER FLOW RATES

CHEMICAL DOSE	CHEMICAL FULL SCALE	800	1000	1200	1400	1600	1800	gpm/Inc.
		1.15	1.44	1.73	2.02	2.30	2.59	mgd/Inc.
		3.69	4.61	5.53	6.45	7.37	8.29	mgd/ 3.2 Inc.
POLYMER PPM	(LB/DAY)							
0.1		3.1	3.8	4.6	5.4	6.1	6.9	
0.2		6.1	7.7	9.2	10.8	12.3	13.8	
0.5		15.4	19.2	23.1	26.9	30.7	34.6	
POLYMER PPM	Concentrated Polymer							
0.1	(gal/day)	7.4	9.2	11.1	12.9	14.7	16.6	
0.2	@5.0 %TS	14.7	18.4	22.1	25.8	29.5	33.2	
0.5		36.9	46.1	55.3	64.5	73.7	82.9	
POLYMER PPM	Diluted Polymer							
0.1	(gpm)	0.1	0.1	0.2	0.2	0.2	0.2	
0.2	@0.25% TS	0.2	0.3	0.3	0.4	0.4	0.5	
0.5		0.5	0.6	0.8	0.9	1.0	1.2	
POLYMER PPM	Storage (Days)	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	
0.2								
ALUM PPM	(LB/DAY)							
20		615	769	922	1076	1230	1384	
40		1230	1537	1845	2152	2460	2767	
60		1845	2306	2767	3228	3689	4151	
ALUM PPM	(gal/day)							
20	@48.8 %	114	142	171	199	228	256	
40		228	285	342	399	455	512	
60		342	427	512	598	683	769	
ALUM PPM	(gal/min)							
20	@48.8 %	0.08	0.10	0.12	0.14	0.16	0.18	
40		0.16	0.20	0.24	0.28	0.32	0.36	
60		0.24	0.30	0.36	0.42	0.47	0.53	
ALUM PPM	Storage (Days)	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	#VALUE!	
40								
SULFIDE PPM	(lb/day)							
2		61	77	92	108	123	138	
3		92	115	138	161	184	208	
4		123	154	184	215	246	277	
ODOR SCRUBBER H2O SULFIDE @ 2 PPM	(gal/min)							
250		20.5	25.6	30.7	35.8	41.0	46.1	
500		10.2	12.8	15.4	17.9	20.5	23.0	
750		6.8	8.5	10.2	11.9	13.7	15.4	
SLUDGE	(dry tons/day)							
3 L/1260 L H2O	@2.5 %TS	0.9	1.1	1.4	1.6	1.8	2.1	
SLUDGE @2.5% TS	(gallons/day)							
3 L/1260 L H2O		8777	10971	13166	15360	17554	19749	
5 L/1260 L H2O		14629	18286	21943	25600	29257	32914	

SLUDGE @2.5% TS 3 L/1260 L H2O 5 L/1260 L H2O	(gallons/min)	6.1 10.2	7.6 12.7	9.1 15.2	10.7 17.8	12.2 20.3	13.7 22.9
CONC. SLUDGE @ 15% TS @ 20% TS @ 25% TS @ 30% TS @ 35% TS @ 40% TS @ 45% TS @ 50% TS @ 60% TS	(gallons/day) S.G. = 1.0	1243 878 658 512 408 329 268 219 146	1554 1097 823 640 509 411 335 274 183	1865 1317 987 768 611 494 402 329 219	2176 1536 1152 896 713 576 469 384 256	2487 1755 1317 1024 815 658 536 439 293	2798 1975 1481 1152 917 741 603 494 329
CONC. SLUDGE @ 15% TS @ 20% TS @ 25% TS	(gal/min)	0.9 0.6 0.5	1.1 0.8 0.6	1.3 0.9 0.7	1.5 1.1 0.8	1.7 1.2 0.9	1.9 1.4 1.0
YEARLY CHEM COSTS	(\$/year)						
POLYMER @ 0.2ppm @0.5 ppm		4489 11222	5611 14027	6733 16833	7855 19638	8977 22444	10100 25249
ALUM @ 40 ppm @ 60 ppm		32992 49488	41240 61860	49488 74232	57736 86604	65984 98976	74232 111348
SLUDGE DISPOSAL COST (\$/Year)							
HAZ. WASTE 20% TS		500972	626215	751458	876701	1001944	1127187
HAZ. WASTE 25% TS		400778	500972	601166	701361	801555	901749
HAZ. WASTE 30% TS		333981	417477	500972	584467	667963	751458
HAZ. WASTE 40% TS		250486	313107	375729	438350	500972	563593
HAZ. WASTE 50% TS		200389	250486	300583	350680	400778	450875
HAZ. WASTE 60% TS		166991	208738	250486	292234	333981	375729
HAZ. WASTE 70% TS		143135	178919	214702	250486	286270	322053
NON-HAZ WASTE 2.5%		667963	834953	1001944	1168934	1335925	1502916
NON-HAZ WASTE 20%		83495	104369	125243	146117	166991	187864
NON-HAZ WASTE 25%		66796	83495	100194	116893	133593	150292
STEAM NEEDED 15 TO 30% TS 15 TO 40% TS 15 TO 50% TS 15 TO 60% TS 20 TO 30% TS 20 TO 40% TS 20 TO 50% TS 20 TO 60% TS	(lb/hr)	39.6 49.5 55.5 67.4 19.8 29.7 35.7 35.7	49.5 61.9 69.3 84.2 24.8 37.1 44.6 44.6	59.4 74.3 83.2 101.0 29.7 44.6 53.5 53.5	69.3 86.7 97.1 117.9 34.7 52.0 62.4 62.4	79.2 99.0 110.9 134.7 39.6 59.4 71.3 71.3	89.1 111.4 124.8 151.5 44.6 66.9 80.2 80.2
	Pilot Plant Detention Time	Full Scale Plant Detention Time (Minutes) With all tanks in service					
RAPID MIX	1	2.2	1.8	1.5	1.3	1.1	1.0
FLOCCULATION	42	127	101	84	72	63	56
CLARIFIER	102	506	405	337	289	253	225

TANK SIZES -(#)	DIMENSIONS (FT)	TOTAL CAPACITY (GALLONS)
RAPID MIX (2)	7'6" x 7'6"	5,721
FLOCCULATION (2)	36'6" x 36'6" x 15'	324,259
CLARIFIER (2)	45'6" x 115'6" x 15'	1,294,785

PUMPS (EXISTING)

1. CONCENTRATED POLYMER PUMPS - 15 GPM @ 230' TDH, P-1166,1167
2. DILUTED POLYMER FEED PUMPS - VARIABLE SPEED 5 GPM @ 170' TDH, P-1168,1169,1170
3. LIME PUMPS - 3 GPM @ 230' TDH, P-1160,1161,1162
4. FERRIC PUMPS - 1 GPM @ 170' TDH, P-1163,1164,1165
5. SLUDGE PUMPS - VARIABLE SPEED - MAX. 150 GPM @ TDH, P-1154,1155,1156,1157

NOTES:

1. SLUDGE GENERATION AT A RATE OF 3 TO 5 LITERS SLUDGE PER 1260 LITERS TREATED WATER.
2. ALUM COST @ \$147 PER DRY TON
3. SHIPPED ALUM = 5.4 LBS DRY ALUM PER GALLON
4. POLYMER COST = \$2.00 PER DRY LB.
5. LIME SLURRY TANK (GALLONS) = ?
6. FERRIC CHLORIDE TANK (GALLONS) = ?
7. CONCENTRATED POLYMER TANK (GAL) = ?
8. DILUTE POLYMER TANKS (2) (GAL) = ?
9. HAZARDOUS WASTE DISPOSAL = \$300 per ton
10. NON-HAZARDOUS WASTE DISPOSAL = \$50 per ton
11. STEAM DRYING = 1.3 (LB/HOUR OF STEAM PER LB/HR WATER EVAPORATED)

FORMULA'S USED:

1. POLYMER (LB/DAY) = PPM * MGD * 8.34
2. POLYMER (GAL/DAY) = (LB/DAY) / 8.34 / 0.05
3. ALUM (LB/DAY) = PPM * MGD * 8.34
4. ALUM (GAL/DAY) = ALUM (LB/DAY) / 5.4 (DRY LBS ALUM PER GALLON)
ALUM (GPM) = ALUM (GAL/DAY) / 24 / 60
5. SULFIDE (LB/DAY) = PPM * MGD * 8.34
6. ODOR SCRUBBER WATER (GAL/MN) = ((SULFIDE LB/DAY)/24/60) / (PPM * 8.34/1000)
7. SLUDGE (DRY TONS/DAY) =
8. SLUDGE (GALLONS/DAY) = MGD * 3 / 1260 * 1000000
9. SLUDGE (DRY TON/DAY) = (GAL/DAY) * 8.34 * 0.025 / 2000
10. SLUDGE (GAL/MN) = (GAL/DAY) / 24 / 60
11. CONCENTRATED SLUDGE (GAL/DAY) = ((DRY TON DAY) * 2000 / %TS)
- (DRY TON * 2000) / 8.34
12. ALUM COST (\$/YEAR) = (LBS/DAY) * 365 / 2000 * \$147 (\$ PER DRY TON)
13. DILUTE POLYMER (GPM) = (LB/DAY) / 24/60 / 0.0025 / 8.34
14. STEAM NEEDS (LB/HR OF STEAM) = (GAL/DAY @ x% TS - GAL/DAY @ y% TS)
/ 24 * 1.3

Appendix C

Water Spray Information

Increasing Thermal Oxidizer Capacity With Water Cooling

A detailed analysis of its options helps a chemical processor route an additional vent stream to a fume incinerator.

..... by Gary N. Alford and John J. Sudnick



Title III of the Clean Air Act Amendments of 1990, as well as state air regulations, require substantial reductions of volatile organic compounds (VOCs) and hazardous air pollutants (HAPs). Industrial facilities affected by these

mandated reductions have several options available to comply with the new requirements. These include:

- Process and operational modifications.
- Changes in raw materials.
- Installation of new air pollution control equipment.
- Modification of existing air pollution control equipment.

Each facility must review its specific systems and process operations to determine the best option or combination of options to pursue. The focus here will be on some of the process, mechanical and operational changes that need to be considered when modifying existing control equipment.

Planning for expansion

A chemical manufacturer operates a number of processes that generate streams containing VOC and HAP emissions. Stream 1 is from a drying operation and is composed predominantly of air with small amounts of organics. The flow rate is constant, although there may be some variation in the organic concentrations in the stream. Stream 2 is a reactor vent of mostly organics with some nitrogen generated by the reactor purge. This stream is intermittent, having a flow duration of between five and 15 minutes. Stream 3 also is a reactor vent, composed primarily of organics with some nitrogen from the reactor purge.

The constituent profile of each stream is given in Table 1. The three streams are controlled by a thermal oxidizer system as shown in Figure 1.

The facility's plans to add reactor capacity which will create a fourth vent stream. Like streams 2 and 3, this additional stream will consist primarily of organics with some purge nitrogen.

The process

Streams 2 and 3, rich in organics, are fed directly into the thermal oxidizer's burner and used as a fuel source. Stream 1, which is primarily air, is used as combustion air for the burner. These three streams, if oxidized without additional air and a small base load of conventional fuel, would produce combustion prod-

ucts at a temperature of approximately 2900°F. Operating at this temperature would definitely destroy the VOCs and HAPs; however, NO_x production would be excessive, and the high temperature would require an expensive combustion chamber.

Operating in a range of 1400°F to 1800°F, with a residence time of 0.75 seconds, would produce the desired destruction, minimize NO_x production and provide for a reasonably priced unit. To accomplish this, ambient air or stream 1 is blended with burner combustion products to provide cooling.

The control system for the oxidizer uses a microprocessor-based digital controller to accommodate the erratic flow and inconsistent composition of streams 2 and 3. It controls the operation as follows:

- The system is started with natural gas using fresh air brought in through a bleed valve on the combustion blower.
- Once the unit has reached operating temperature (1400°F), stream 1 is introduced into the system to replace the fresh air flow. The fresh air flow is automatically reduced as the pressure sensor in the fan inlet detects the increased flow for stream 1 and the programmable logic controller (PLC) closes the fresh air bleed valve.
- The pressure sensor at the fan inlet continuously monitors the pressure and through the PLC automatically adds or deletes ambient air to maintain a constant inlet pressure. This insures a constant draft on the process.
- As stream 1 enters the oxidizer, the organics in the stream will cause the temperature in the chamber to rise. This will be sensed by a control thermocouple.
- The PLC will react to the thermocouple signal by actuating the natural gas control valve and reducing the gas flow.

The unit will operate in this mode with the PLC reacting to the changes in the gas temperature in the combustion chamber and adjusting the natural gas flow accordingly. At some point during the process operation, stream 2 or 3 will be vented and enter the oxidizer, and the following sequence will occur:

- The addition of an organically rich stream will cause the temperature in the combustion chamber to rise.
- As the temperature rises, the control thermocouple will sense the rise and signal the PLC to reduce the flow of natural



REGULATORY IMPACT

► 40 Code of Federal Regulations (CFR) 63.

gas to the burner.

- The flow of natural gas will be reduced until the gas temperature in the combustion chamber reaches the operating set point or the natural gas control flow reaches its minimum closed position.
- If the temperature continues to rise, the PLC will begin to add air using a control valve located between the combustion air fan and the combustion chamber.
- The PLC and the pressure sensor on the fan inlet will maintain the inlet pressure by admitting ambient air into the system through the bleed valve.
- Enough air will be added to the system to maintain the chamber temperature operating set point (1600°F, plus or minus 200°F).
- As the flow of organics subsides, the control system will reduce the amount of cooling air to maintain temperature.

Oxidation, with chaser

The volume of the combustion chamber (245 feet³) was designed to accommodate the maximum flow of the three streams and the air required to cool the products of combustion to an operating temperature of 1800°F. This volume insured a minimum residence time of 0.75 seconds at 1800°F. If a fourth stream were added, along with the required cooling air, there would not be sufficient volume in the combustion chamber to attain the required residence time.

Adding a fourth stream would require some type of modification. The options available included:

1. Installation of a larger thermal oxidizer to handle all four streams.
2. Enlarging the combustion chamber of the existing thermal oxidizer, and installing a larger fan for the additional cooling air required.
3. Cooling the combustion products with water.

An options analysis considered capital cost, operating cost, available floor space, disruption of the operation and maintenance. The results of the analysis showed water cooling to be the best option. In fact, using water cooling would actually increase the residence time even with the addition of the fourth stream. This is illustrated:

$$Q_g = M C_p \Delta T$$

Q_g = Energy content of gas, Btu

M = Mass of the gas, lb.

C_p = Average specific heat of gas at constant pressure, Btu/lb.°F

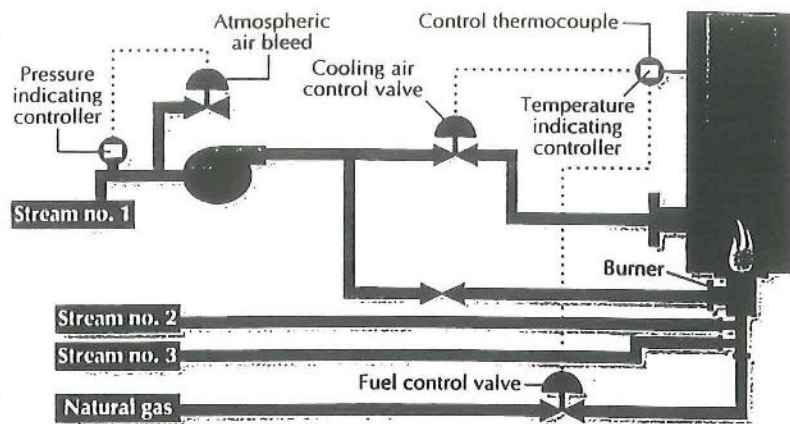
ΔT = Temperature difference, °F

- Mass of combustion products generated by the combustion of streams 1, 2, 3 and 4 and assist fuel = 9500 lbs./hour.
- Temperature of combustion products = 3700°F (does not account for heat loss).
- Calculate energy in gases which must be absorbed by the cooling media.

$$Q_g = 9500 \frac{\text{lb.}}{\text{hour}} \times 0.345 \frac{\text{Btu}}{\text{lb.}^\circ\text{F}} \times (3700^\circ\text{F} - 1800^\circ\text{F})$$

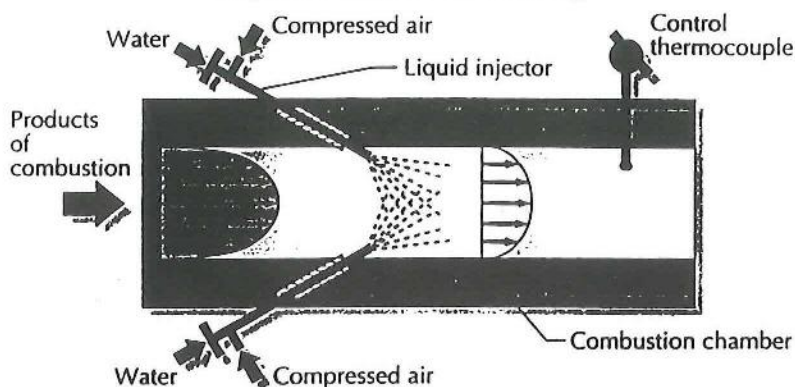
$$Q_g = 6,230,000 \text{ Btu/hour}$$

Thermal Oxidation System with Air Cooling



• Figure 1. A thermal oxidation system with air cooling controls three streams containing VOC and HAP emissions.

Aqueous Injection Cooling



• Figure 2. A new, water-injection cooling system provides consistent temperature and increased residence time for gases.

- Q_g = the heat the cooling media must absorb.
- Calculate amount of air required to cool from 3700°F to 1800°F.

M_a = mass of cooling air required

$$Q_g = Q_a = M_a \frac{\text{lb.}}{\text{hour}} (0.24) \frac{\text{Btu}}{\text{lb.}^\circ\text{F}} \times (1800^\circ\text{F} - 60^\circ\text{F})$$

$$6,230,000 = M_a (0.24)(1740)$$

$$M_a = 14,920 \text{ lb./hour}$$

- Calculate amount of water required for cooling.

M_w = mass of cooling water required

$$Q_g = Q_w = \left(M_w (212^\circ\text{F} - 60^\circ\text{F}) 1 \frac{\text{Btu}}{\text{lb.}^\circ\text{F}} \right) + \left(M_w (h_{fg}) \right) + \left(M_w (0.5) \frac{\text{Btu}}{\text{lb.}^\circ\text{F}} (1800 - 212) \right)$$

Term 1: The sensible heat required to raise the liquid water to its boiling point.

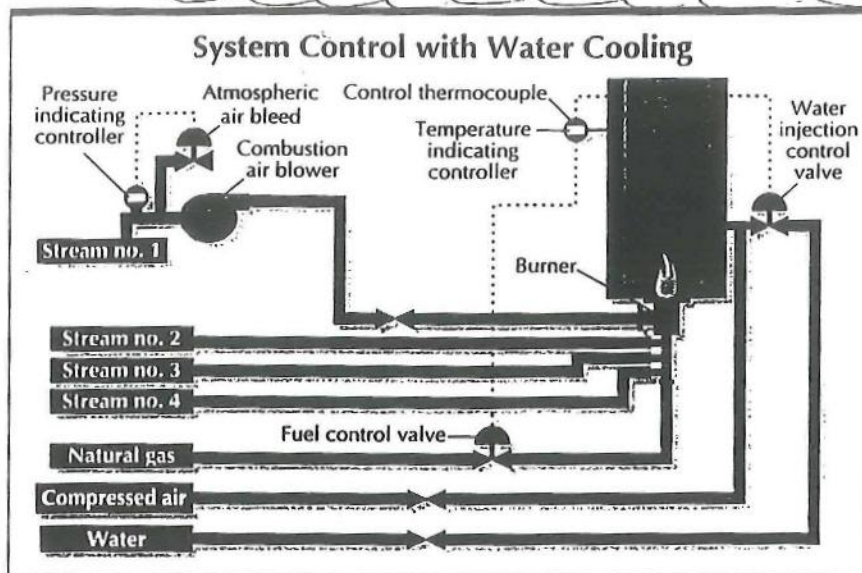
Term 2: The latent heat of vaporization.

Term 3: The sensible heat to raise the water vapor to the operating temperature.

$$6,230,000 = M_w (152) + M_w (970) + M_w (794)$$

$$M_w = \frac{6,230,000}{1916} = 3250 \text{ lb./hour}$$

An options analysis found more than four times as much air as water would be required to cool the combustion gases.



• Figure 3. The revised control scheme includes four streams and water cooling.

Table 1. Profile of Streams

Stream number	Component	Flow (lb./hour)
Stream 1	Toluene (C_7H_8)	20
	Methyl ethyl ketone (MEK) (C_4H_8O)	10
	Methyl isobutyl ketone (MIBK) ($C_6H_{12}O$)	15
	Air	8000
Stream 2	Toluene (C_7H_8)	120
	Methyl ethyl ketone (MEK) (C_4H_8O)	50
	Methyl isobutyl ketone (MIBK) ($C_6H_{12}O$)	75
	Nitrogen (N_2)	200
Stream 3	Ethyl acetate ($C_4H_8O_2$)	80
	N-butyl acetate ($C_6H_{12}O_2$)	130
	Nitrogen (N_2)	250
Stream 4	Ethyl acetate ($C_4H_8O_2$)	100
	N-butyl acetate ($C_6H_{12}O_2$)	120
	Nitrogen (N_2)	300

Therefore, more than four times as much air as water is required to cool the combustion gases from 3700°F to 1800°F.

Mechanical considerations

Several mechanical items must be carefully addressed in the design of a water cooling system:

- **Nozzle location.** The aqueous injectors' location in the combustion chamber is critical. If they are located too far down in the chamber, the gases may not be cooled quickly enough. If they are too close to the burner, they may "chill" the flame, producing products of incomplete combustion (PICs).

- **Nozzle angle.** The angle at which the water spray is

injected into the chamber will have a significant effect on cooling efficiency and the life of the refractory lining. If the angle of injection is too shallow, the water spray will not penetrate the core of hot gases and channeling can occur. If the angle is too steep, the water spray can impinge on the opposite wall, causing spalling and erosion of the ceramic lining.

- **Atomization and spray pattern.** The size distribution and the spray pattern of the water droplets are critical in the cooling efficiency of the system. The smaller the droplets, the more surface area is exposed and the greater the heat transfer. Proper coverage of the chamber cross sectional area with the spray insures a well-mixed gas flow with a homogeneous temperature profile. The net effect is a flat, consistent temperature profile developed in a rela-

tively short distance within the combustion chamber. This is crucial to providing quick and accurate temperature control for the system. See Figure 2 for an illustration of the cooling mechanism.

- **Nozzle cooling.** In general, water flowing through the aqueous injectors will sufficiently cool them. But during operating periods when water injection is not required, provisions must be made to cool the nozzle tips exposed to the high-temperature combustion gases. This usually is done with a combination of shielding and a small stream of compressed air.

Control of the water cooling system uses the same logic as the cooling air system. Increases in temperature initially adjust fuel flow and then add water once the fuel has reached its minimum flow limit. The revised control scheme, with all four VOC streams on line, is illustrated in Figure 3.

Conclusions

The use of water to cool the combustion products offered several advantages: First, the facility could add a fourth stream using existing equipment with only minor modifications.

Second, the residence time of the gases actually increased. Additionally, the response time of the system to flow and composition changes was improved. Oxidizer performance improved because turbulence and mixing in the combustion chamber was increased.

Use of an options analysis provided a low-cost solution that helped the chemical company's bottom line and improved operations.

Gary N. Alford, P.E., is a project engineer, and John J. Sudnick, P.E., is director of the air quality division with Eckenfelder Inc., Greenville, S.C., 864-234-0303.

Reader Interest Review

Please circle the appropriate number on the Reader Service Card to indicate the level of interest in the article.

High 206

Medium 207

Low 208



PROGRAM MANAGEMENT CENTER

Memorandum

To: Master Plan Project Advisory Committee (MP PAC)
From: Bob Molzahn
Date: March 28, 1995
Subject: Operating Cost Comparison

The attached table presents the results of a survey of actual costs for wastewater treatment plant operation and maintenance in 1993. A copy of the survey questionnaire is also attached.

The purpose of this survey was to begin the process of understanding how the Metro Plant is different than other large wastewater treatment plants in the midwest. Review of the cost information and staffing levels will allow the MP PAC to look for the underlying reasons that allow some plants to operate at less cost and with fewer people.

Additional information has been requested by the MP PAC to begin this analysis. During this period of analysis, it is important to understand that such cost differences can often be traced to the differences in the basic plant design and the inherent requirements of equipment and processes. Other factors affecting cost include effluent and regulatory requirements. Only after the MP PAC has analyzed and interpreted this and supplemental information can the MP PAC begin to identify meaningful opportunities for savings.

File: Task 6 Chrono

Comparative Plant Operating Costs

Agency:	MCWS	Chicago	Chicago	Cleveland	Cleveland	Cleveland	St. Louis	St. Louis	Cincinnati	Milwaukee	Milwaukee	Fort Worth, TX
Plant:	Metro	Northside	Calumet	Easterly	Southerly	East+South	Bissell	Lemay	Mill Creek	Jones Island	So. Shore	Village Creek
Rated capacity(mgd)	250	330	427	155	175	330	150	167	130	300	113	120
Eff. BOD(mg/l)		8	3	3	6		10	10	25	11	30	2
Eff. SS(mg/l)		7	8	3.6	3		10	10	30	11	30	1
Eff. NH3(mg/l)		1	3.6		0.24		2	40		4.8	seasonal	0.17
Eff. P(mg/l)				0.32	0.32		2	5		0.27	1	na
1993 flow(mgd)	225	236	308	157.5	126	283.5	163	127	147	121	104	124.4
1993 BOD (#/day)	380000	217000	331000	160250	366000	526250	332000	108000	318000	279500	126000	214000
1993 SS (#/day)	400000	282600	318000	185200	369000	554200	352000	141000	259000	194800	119700	223000
bar screens	Y	Y	Y	Y	Y		comm.	comm.	Y	Y	Y	Y
grit removal	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y
primary	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y
activated sludge	Y	Y	Y	Y	Y		Y	Y	Y	Y	Y	Y
nitrification	Y	Y	Y	n	Y		Y	n	Y	n	y(seasonal)	Y
Bio P removal	n	n	n	n	Y		n	n	n	n	n	n
Chem P removal	n	n	n	Y	n		n	n	n	Y	Y	n
chlorination	Y	n	n	Y	Y		n	n	Y	Y	Y	Y
dechlorination	Y	n	n	Y	Y		n	n	n	Y	Y	Y
effl. aeration	Y	n	n	note 2	note 4		n	n	n	n	n	n
aeration system	coarse		fine	fine	fine		fine	33fine	fine	fine	fine	?
prim. sludge thickening	gravity	gravity	gravity	n	gravity		n	n	gravity	prim. clarifiers	gravity	
WAS thickening	DAF	gravity		primaries	grav.belt		gravity belts	primaries	DAF	centrif&GBT	DAF	
sludge stabilization	Zimpro	n	anaer dig	n	Zimpro		n	n	anaerobic dig.	heat drying	anaerobic dig.	anaerobic dig.
dewatering	ROLL/VF	n	note 1	n	VF		BFP	BFP	BFP	BFP	centrif+P&FP	mech&drying bed
ultimate disposal	incinerate	n	LF cover	note 3	incinerate		incinerate	incinerate	MH incin/ash	Miloganite	land application	land application
salaries & fringe	\$26,776,075			\$2,650,000	\$9,080,000	\$11,730,000	\$4,563,000	\$3,174,000	\$8,394,000	\$12,500,000	\$1,919,000	\$4,134,760
chemicals	\$1,772,099			\$82,500	\$416,000	\$498,500	\$563,000	\$316,000	\$1,070,000	\$1,700,000	\$259,000	\$1,212,200
utilities	\$10,167,236	\$2,900,000		\$1,311,000	\$8,157,000	\$9,468,000	\$4,963,000	\$1,897,000	\$4,005,390	\$7,100,000	\$1,024,000	\$2,120,000
Maint. materials/supplies	\$4,049,846			\$200,000		\$200,000	\$2,030,000	\$1,362,108	\$911,000	\$1,900,000	\$40,000	\$1,409,000
contracted services	\$2,000,000			\$200,000	\$1,100,000	\$1,300,000	\$250,000	\$276,000	\$255,000	\$3,900,000	\$3,279,000	\$6,633,100
other	\$210,000			\$145,350	\$1,869,000	\$2,014,350	\$300,000	\$0	\$1,564,610	\$200,000		\$111,000
total	\$44,975,256	\$13,400,000	\$21,430,000	\$4,588,850	\$20,622,000	\$25,210,850	\$12,669,000	\$7,025,108	\$16,200,000	\$27,300,000	\$6,522,000	\$15,621,000
no. of plant staff	485	195	260	70	238	308	103	69	122			119
electrical cost (\$/kwh)		0.04793					0.043	0.0472	0.041	0.051	0.0314	
cost / mg treated (\$/mg)	548	156	191	80	448	244	213	152	302	618	172	344
cost/1000#BOD treated	324	169	177	78	154	131	105	178	140	268	142	200
cost /1000#SS treated	308	130	185	68	153	125	99	137	171	384	149	192
no. staff/mgd of capacity	1.94	0.59	0.61	0.45	1.36	0.93	0.69	0.41	0.94	0.00	0.00	0.99
staff \$ as % of total	60%	0%	0%	58%	44%	47%	36%	45%	52%	46%	29%	26%
utilities \$ as % of total	23%	22%	0%	29%	40%	38%	39%	27%	25%	26%	16%	14%
contact at plant:		Notes:	1- 40% to lagoons and 60% to centrifuges				Roger Wieting		Bill Beyer			
contact's phone #:			2- screw pumps for effluent				314/638/7477		513-244-5170			
			3- all sludge pumped to Southerly Plant									
			4- gravity effl filters									
			5-trucked as 58% solids to Texas landfill									



Rules Chapter 1805.0100-1805.1600

(Board of AELSLAGID)

1805.0100	Professional conduct.
1805.0200	Personal conduct.
1805.0300	Conflict of interest.
1805.0400	Improper solicitation of employment.
1805.0500	False or malicious statements.
1805.0600	Knowledge of improper conduct by others.
1805.0700	Action by other jurisdiction.
1805.0800	Employment on the basis of merit.
1805.0900	Misconduct.
1805.1500	Registration.
1805.1600	Responsible charge and direct supervision.

1805.0100 PROFESSIONAL CONDUCT.

Subpart 1. **Purpose.** This rule of professional conduct is adopted for the purpose of implementing the laws and rules governing the practice of architecture, engineering, land surveying, landscape architecture, and geoscience including Minnesota Statutes, section 326.11.

Subp. 2. **Scope.** This rule is applicable to and binding upon each person, corporation, or partnership subject to the regulatory jurisdiction of the board and each person subject to the control of the licensee.

Subp. 3. **Imputed knowledge of professional responsibility.** Each licensee who holds a certificate of licensure issued by the board is charged with knowledge of this rule. In the exercise of the privileges and rights granted by the certificate of licensure, the licensee shall conform professional conduct to the public and to the board in accordance with the provisions of this rule, and shall, as a condition of licensure, subscribe to and agree to conduct the practice in accordance with the provisions of this rule.

STAT AUTH: MS s 326.06
HIST: 17 SR 1279; 22 SR 90

1805.0200 PERSONAL CONDUCT.

Subpart 1. **Public confidence and personal integrity.** A licensee shall avoid any act which may diminish public confidence in the profession and shall, at all times, conduct himself or herself, in all relations with clients and the public, so as to maintain its reputation for professional integrity.

Subp. 2. **False statements and nondisclosure.** A licensee shall not submit a materially false statement or fail to disclose a material fact requested in connection with the application for certification or licensure in this state or any other state.

Subp. 3. **Knowledge of unqualified applicants.** A licensee shall not further the application for certification or licensure of another person known by the licensee to be unqualified in respect to character, education, or other relevant factor.

Subp. 4. **General prohibitions.** A licensee shall not:

A. circumvent a rule of professional conduct through actions of another;

* B. engage in illegal conduct involving moral turpitude;

C. engage in conduct involving dishonesty, fraud, deceit, or misrepresentation;

D. engage in conduct that adversely reflects on the licensee's fitness to practice the profession; or

E. permit the licensee's name or seal to be affixed to plans, specifications, or other documents which were not prepared by or under the direct supervision of the licensee.

STAT AUTH: MS s 326.06

HIST: 17 SR 1279

1805.0300 CONFLICT OF INTEREST.

Subpart 1. **Employment.** A licensee shall avoid accepting a commission where duty to the client or the public would conflict with the personal interest of the licensee or the interest of another client. Prior to accepting such employment the licensee shall disclose to a prospective client such facts as may give rise to a conflict of interest.

Subp. 2. **Compensation.** A licensee shall not accept compensation for services relating or pertaining to the same project from more than one party unless there is a unity of interest between or among the parties to the project and unless the licensee makes full disclosure and obtains the express consent of all parties from whom compensation will be received.

Subp. 3. **Gifts.** A licensee shall not, directly or indirectly, solicit or accept any compensation, gratuity, or item of value from contractors, their agents, or other persons dealing with the client or employer in connection with the work for which the licensee has been retained without the knowledge and approval of the client or the employer.

STAT AUTH: MS s 326.06

1805.0400 IMPROPER SOLICITATION OF EMPLOYMENT.

A licensee shall seek and engage in only the professional work or employment the professional is competent and qualified to perform by reason of education, training, or experience.

A licensee shall not falsify or misrepresent the extent of the licensee's education, training, experience, or qualifications to any person or to the public; nor misrepresent the extent of the licensee's responsibility in connection with any prior employment.

A licensee shall not transmit, distribute, or publish or allow to be transmitted, distributed, or published, any false or misleading information regarding the licensee's own qualifications, training, or experience or that of his or her employer, employees, associates, or joint venturers.

A licensee shall not tender any gift, pay, or offer to pay, directly or indirectly, anything of substantial value, whether in the form of a commission or otherwise, as an inducement to secure employment. A licensee is not prohibited from paying a commission to a licensed employment agency for securing a

salaried position.

STAT AUTH: MS s 326.06
HIST: 17 SR 1279

1805.0500 FALSE OR MALICIOUS STATEMENTS.



A licensee shall make no false or malicious statements which may have the effect, directly or indirectly, or by implication, of injuring the personal or professional reputation or business of another member of the profession.

STAT AUTH: MS s 326.06
HIST: 17 SR 1279

1805.0600 KNOWLEDGE OF IMPROPER CONDUCT BY OTHERS.

A licensee who has knowledge or reasonable grounds for believing that another member of the profession has violated any statute or rule regulating the practice of the profession shall have the duty of presenting such information to the board.

A licensee, when questioned concerning any alleged violation on the part of another person by any member or authorized representative of the board commissioned or delegated to conduct an official inquiry, shall neither fail nor refuse to divulge such information as the licensee may have relative thereto.

STAT AUTH: MS s 326.06
HIST: 17 SR 1279

1805.0700 ACTION BY OTHER JURISDICTION.

Convictions of a felony without restoration of civil rights, or the revocation or suspension of the certificate of licensure of a licensee by another jurisdiction, if for cause which in the state of Minnesota would constitute a violation of law or of these rules, shall be deemed to be a violation of these rules of professional conduct. Any licensee adjudged mentally incompetent by a court of competent jurisdiction shall, until restored to mental competency, be deemed to be incompetent to practice the profession within the meaning of Minnesota Statutes, section 326.11, subdivision 2.

STAT AUTH: MS s 326.06
HIST: 17 SR 1279

1805.0800 EMPLOYMENT ON THE BASIS OF MERIT.

A licensee as an employer, shall refrain from engaging in any discriminatory practice prohibited by law and shall, in the conduct of the business, employ professional personnel solely upon the basis of merit.

STAT AUTH: MS s 326.06
HIST: 17 SR 1279

1805.0900 MISCONDUCT.

Misconduct within the meaning of Minnesota Statutes, section 326.11, subdivision 1 shall include any

act or practice in violation of the rules of professional conduct as set forth in parts 1805.0100 to 1805.0800.

STAT AUTH: MS s 326.06

1805.1500 REGISTRATION.

No corporation, partnership, or other firm engaged in the practice of architecture, engineering, land surveying, landscape architecture, or geoscience, or two or more of these professions, shall contract with or accept employment for professional services of an architectural, engineering, land surveying, landscape architectural, or geoscience character as defined in Minnesota Statutes, sections 326.02 to 326.15 unless a member or employee of the corporation, partnership, or other firm in responsible charge of the work is registered and licensed under the provisions of Minnesota Statutes, sections 326.02 to 326.15 to practice the profession called for by the employment.

STAT AUTH: MS s 326.06
HIST: 22 SR 90

1805.1600 RESPONSIBLE CHARGE AND DIRECT SUPERVISION.

Subpart 1. **Responsible charge; defined.** A person in responsible charge of architectural, engineering, land surveying, or landscape architectural work as used in Minnesota Statutes, section 326.14 means the person who determines design policy, including technical questions, advises with the client, superintends subordinates during the course of the work and, in general, the person whose professional skill and judgment are embodied in the plans, designs, and advice involved in the work. Plans and specifications for buildings, structures, or projects of standard design which have been designed outside the state shall bear the certification of the design professional licensed in another United States licensing jurisdiction. In addition, a Minnesota licensed architect, professional engineer, or landscape architect shall review the design and certify that it is appropriate to the site on which construction is proposed and is in compliance with the state building code adopted by the Department of Administration where the building code is in effect.

Subp. 2. **Direct supervision; defined.** A person in direct supervision of work as referred to in Minnesota Statutes, section 326.12, subdivision 3, means that person who is the employer, an employee of the same firm, or who is under contract to or from another firm and who is in responsible charge of technical, architectural, engineering, land surveying, or landscape architectural work in progress, whose professional skill and judgment are embodied in the plans, specifications, reports, plats, or other documents required to be certified pursuant to that subdivision. A person in direct supervision of work directs the work of other licensees, interns, draftspersons, technicians, or clerical persons assigned to that work and is in responsible charge of the project comprising the work being supervised.

STAT AUTH: MS s 326.06

● [Return to Main Page](#)



UNITED STATES ENVIRONMENTAL PROTECTION AGENCY

REGION 5

77 WEST JACKSON BOULEVARD

CHICAGO, IL 60604-3590

REPLY TO THE ATTENTION OF

October 19, 2000

Rebecca J. Flood, Manager
Environmental Compliance Section
Metropolitan Council Environmental Services
230 East Fifth Street
St. Paul, MN 55101

Re: United States v. Metropolitan Council
Civil Action No. 99-CV-1105

Dear Ms. Flood:

As requested, enclosed please find a copy of the comment which our office received on the proposed consent decree between the United States and Metropolitan Council lodged with the court in August 2000.

If you have any questions, please call me at (312) 886-6237.

Sincerely,

A handwritten signature in dark ink, appearing to read "Mary T. McAuliffe".

Mary T. McAuliffe
Associate Regional Counsel

Enclosure

To: Mary McAuliffe

Subject: Metro CD comments

Mary, Here are my responses to the comments made on the Metro CD.

Comment 1) As we discussed this morning, the SEP costs are basically immaterial. We are concerned with the potential reduction in air pollution. Also, we cannot wait to determine whether to allow a SEP until after the SEP has been completed. We have to go on calculations.

I thought the ESP was going in now. Could you check on that? Or would I have better luck using another means?

Comment 2) Mr. Greenwood made the comment that derating the incinerators would represent tens of millions of dollars in lost equipment. This is not necessarily the case. We did not derate the incinerators to a rate that was below their typical operating periods. They will still have an excess in capacity for the next several years before the new incinerators are installed. The purpose of the derating is to distribute the incineration of the sewage solids among all the incinerators rather than overloading one single incinerator. If you account for the fact that the derating will reduce emergency bypass events, then you may actually be able to estimate an increase in the total capacity of the plant to burn sewage solids. This is because a bypass event causes the flow of solids to the incinerator to be stopped during a shutdown and startup process.

Mr. Greenwood's comments about the installation of new ID fans may be better answered by facility representatives. I believe that this idea was scrapped because structural constraints made this either physically or economically infeasible. This is at least the case when one accounts for the fact that the multi-hearth incinerators are problematic and need to be replaced.

Comparing 490 tpd of capacity (presently) and 485 tpd in future capacity is not the whole story. 485 tpd of reliable capacity is much more valuable than a 490 tpd capacity that is only theoretical. In reality, the reliable capacity of the present incinerators is much lower.

Comment 3) I cannot comment on the others, but the multiple-hearth incinerator in Indianapolis is very dirty. The neighborhood near it is probably the worst within the city limits.

Let me know if you have any questions.

Your favorite scientist of few words.

DC 20044-7611, and should refer to *United States v. Amoco Pipeline Company, Inc.*, DOJ No. 90-5-1-1-06365. The proposed Consent Decree may be examined at the Office of the United States Attorney for the Southern District of Texas, Houston, Texas, and the Region VI Office of the United States Environmental Protection Agency, 1445 Ross Avenue, Dallas, Texas 75202. A copy of the proposed Consent Decree may be obtained by mail from the Department of Justice Consent Decree Library, P.O. Box 7611, Washington, DC 20044. In requesting a copy, please enclose a check for reproduction costs (at 25 cents per page) in the amount of \$4.00 for the Decree, payable to the Consent Decree Library.

Bruce S. Gelber,
Deputy Chief, Environmental Enforcement
Section, Environment and Natural Resources
Division.

[FR Doc. 00-22136 Filed 8-29-00; 8:45 am]

BILLING CODE 4410-15-M

DEPARTMENT OF JUSTICE

Lodging of Consent Decree Under Certain Air Act

In accordance with Departmental policy, 38 CFR 50.7, notice is hereby given that a proposed consent decree in *United States v. Appleton Papers, Inc.*, C.A. No. 00-216-J, was lodged on August 16, 2000, with the United States District Court for the Western District of Pennsylvania. The consent decree resolves the United States' claims against Defendant Appleton Papers, Inc. for violations of Section 111 of the Clean Air Act, 42 U.S.C. § 7411, and the Pulp Mill New Source Performance Standards ("NSPS"), 40 CFR part 60, subpart BB, with respect to the operation of Appleton's brown stock washer system. Further, the consent decree resolves the United States' claim that Appleton failed to comply with a recovery boiler fuel use limitation contained in an operating permit, issued pursuant to the Commonwealth of Pennsylvania's State Implementation Plan. The violations occurred at Appleton's facility, located in Roaring Spring, Pennsylvania.

In addition, the consent decree resolves the claims alleged in the Commonwealth of Pennsylvania's complaint-in-intervention, which is based upon the same violations referenced above.

Under the consent decree, Appleton has agreed to pay a civil penalty in the amount of \$490,000. Further, Appleton will implement agreed-upon injunctive relief, requiring the construction of a

Pulp Project that will bring Appleton into compliance with the Clean Air Act and the applicable NSPS regulations not later than January 31, 2002. Moreover, completion and implementation of the Pulp Project will result in Appleton's early compliance with the National Emission Standards for Hazardous Air Pollutants from the Pulp and Paper Industry, 40 CFR part 63, subpart S, which become effective in 2006.

The Department of Justice will receive, for a period of thirty (30) days from the date of this publication, comments relating to the proposed consent decree. Comments should be addressed to the Assistant Attorney General for the Environment and Natural Resources Division, Department of Justice, Washington, D.C. 20530, and should refer to *United States v. Appleton Papers, Inc.*, DOJ Reference No. 90-5-2-1-06607.

The proposed consent decree may be examined at the Office of the United States Attorney, 633 Post Office and Courthouse Building, Pittsburgh, Pennsylvania 15219; and the Region III Office of the Environmental Protection Agency, 1650 Arch Street, Philadelphia, Pennsylvania 19103. A copy of the proposed consent decree may be obtained by mail from the Department of Justice Consent Decree Library, P.O. Box 7611, Washington, D.C. 20044. In requesting a copy, please refer to the referenced case and enclose a check in the amount of \$12.75 (25 cents per page production costs), payable to the Consent Decree Library.

Walker B. Smith,
Deputy Chief, Environmental Enforcement
Section, Environment and Natural Resources
Division.

[FR Doc. 00-22130 Filed 8-29-00; 8:45 am]

BILLING CODE 4410-15-M

DEPARTMENT OF JUSTICE

Notice of Lodging of Consent Decree Under the Clean Water Act and the Oil Pollution Act

Consistent with Department of Justice policy, notice is hereby given that on August 18, 2000, a proposed Consent Decree in *United States v. Davidson Sales & Maintenance, Inc. and Jack L. Davidson*, Civil Action No. 99-73518, was lodged with the United States District Court for the Eastern District of Michigan, Southern Division.

In the action, the United States sought civil penalties under Section 311(b)(7) of the Clean Water Act, 33 U.S.C. 1311(b)(7), and the recovery of removal costs under Sections 1002 and 1017 of the Oil Pollution Act, 33 U.S.C. 2702,

2717, resulting from a discharge of oil into the Wilkenson Creek in Chelsea, Washtenaw County, Michigan, in September of 1995. Under the Consent Decree, the Defendants will pay \$80,000, plus interest, over the course of two years in satisfaction of the claim for costs that the Coast Guard paid to a contractor who performed removal activities.

The Department of Justice will receive for a period of thirty (30) days from the date of this publication comments relating to the Consent Decree. Comments should be addressed to the Assistant Attorney General of the Environment and Natural Resources Division, Department of Justice, P.O. Box 7611, Washington, DC 20044-7611, and should refer to *United States v. Davidson Sales & Maintenance, Inc. and Jack L. Davidson*, D.J. No. 90-5-1-1-06768.

The Consent Decree may be examined at the Office of the United States Attorney, 211 W. Fort St., Suite 2300, Detroit, MI 48226-3211. A copy of the Consent Decree may be obtained by mail from the Department of Justice Consent Decree Library, P.O. Box 7611, Washington, DC 20044. In requesting a copy, please refer to the above-referenced case and DOJ Reference Number 90-5-1-1-06768, and enclose a check in the amount of \$4.25 (25 cents per page reproduction cost) payable to the Consent Decree Library.

Bruce S. Gelber,
Principal Deputy Chief, Environmental
Enforcement Section, Environment and
Natural Resources Division.

[FR Doc. 00-22132 Filed 8-29-00; 8:45 am]

BILLING CODE 4410-15-M

DEPARTMENT OF JUSTICE

Lodging of Consent Decree Pursuant to the Clean Air Act

In accordance with the policy of the Department of Justice, 28 U.S.C. 50.7, notice is hereby given that a proposed consent decree in *United States v. Metropolitan Council*, Civ. No. 99-CV-1105 (DFW/AVB), was lodged with the United States District Court for the District of Minnesota on August 11, 2000. The action was brought by the United States against the Metropolitan Council, a subdivision of the State of Minnesota, which, among other things, operates a wastewater sewage treatment plant in St. Paul, Minnesota. The United States' complaint alleged that the Defendant violated various provisions of the Clean Air Act, 42 U.S.C. 7401 *et seq.*, ("Act"), the Act's New Source Performance Standards, 40 CFR part 60,

and the State of Minnesota State Implementation Plan ("SIP") limiting emissions of particulate matter from multiple hearth incinerators operated by the Defendant which burned sewage sludge generated from the wastewater treatment plant.

Under the proposed consent decree, Metropolitan Council will undertake a series of compliance measures designed with the goal of eliminating future violations of applicable emission limitations until new control equipment is installed. Defendant, among other things, has designed and installed new dampers and seals on the incinerator's emergency stacks that will prevent leakage of particulate matter; will develop a fan alarm system; will develop and implement an operator training program; will develop and implement an improved operation and maintenance plan; and will limit the feed rate to the incinerators. In addition, Metropolitan Council is required to replace the existing multiple hearth incinerators with new fluidized bed incinerators in accordance with a schedule attached to the proposed decree.

In addition to the above, Metropolitan Council has agreed to expend not less than \$1.6 million to perform a Supplemental Environmental Project—the installation of a dry electrostatic precipitator—which will result in an additional forty percent (40%) removal of particulate matter from emissions. Installation of this additional control device is not required by the Act or the Minnesota SIP. Beyond these various compliance measures, Metropolitan Council will also pay a civil penalty of \$250,000.

The proposed consent decree may be examined at: (1) the Office of the United States Attorney for the District of Minnesota, United States Courthouse, 300 South Fourth Street, Minneapolis, MN (contact Assistant United States Attorney Friedrich A.P. Siekert (612-664-5600)); (2) the United States Environmental Protection Agency (Region 5), 77 West Jackson Boulevard, Chicago, Illinois 60604-3590 (contact Mary McAuliffe (312-886-6237)); and, (3) a copy of the proposed Consent Decree may be obtained by mail from the Department of Justice Consent Decree Library, P.O. Box 7611, Ben Franklin Station, Washington, DC 20044. When requesting a copy, please refer to *United States v. Metropolitan Council*, DJ #90-5-2-1-2243, and enclose a check in the amount of \$8.25 for the consent decree only (33 pages at 25 cents per page reproduction costs), or \$10.75 for the consent decree and all

appendices (43 pages), made payable to the Consent Decree Library.

Bruce S. Gelber,

Deputy Chief, Environmental Enforcement Section, Environment and Natural Resources Division.

[FR Doc. 00-22133 Filed 8-29-00; 8:45 am]

BILLING CODE 4410-15-M

DEPARTMENT OF JUSTICE

Notice of Extension of Public Comment Period on Eighth Consent Decree in *United States v. Nalco Chemical Company, et al.*, Under the Comprehensive Environmental Response, Compensation, and Liability Act

Notice is hereby given that the public comment period on a proposed eighth Consent Decree in *United States v. Nalco Chemical Company, et al.*, Case No. 91-C-4482 (N.D. Ill.) entered into by the United States on behalf of U.S. EPA and Commonwealth Edison Company has been extended until September 21, 2000. The eighth Consent Decree was lodged on August 3, 1999 with the United States District Court for the Northern District of Illinois. Notice of the public comment period was previously published at 65 FR 44809 (July 20, 2000).

Comments should be addressed to the Assistant Attorney General of the Environment and Natural Resources Division, Department of Justice, P.O. Box 7611, Ben Franklin Station, Washington, D.C. 20044, and should refer to *United States v. Nalco Chemical Company, et al.*, D.J. Ref. No. 90-11-3-687. The proposed Consent Decree may be examined at the Office of the United States Attorney for the Northern District of Illinois, 219 S. Dearborn St., Chicago, Illinois 60604; and the Region V Office of the United States Environmental Protection Agency, 77 West Jackson Street, Chicago, Illinois 60604. A copy of the Consent Decree may also be obtained by request addressed to the Department of Justice Consent Decree Library, P.O. Box 7611, Ben Franklin Station, Washington, DC 20044. In requesting a copy of the Consent Decree, please enclose a check in the amount of \$37.00 (25 cents per page for reproduction costs), payable to the Consent Decree Library.

Bruce S. Gelber,

Deputy Section Chief, Environmental Enforcement Section, Environment and Natural Resources Division.

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DEPARTMENT OF JUSTICE

Notice of Lodging of Consent Decree Pursuant to the Comprehensive Environmental Response, Compensation, and Liability Act

Pursuant to Section 122(d)(2) of the Comprehensive Environmental Response, Compensation, and Liability Act ("CERCLA"), 42 U.S.C. 9622(d)(2), and 28 CFR 50.7, notice is hereby given that a proposed consent decree embodying a settlement in *United States v. Operating Industries, Inc., et al.*, No. CV 00-08794 SVW (CW_x); was lodged on August 18, 2000, with the United States District Court for the Central District of California, Western Division.

In a complaint filed concurrently with the lodging of the consent decree, the United States, the State of California, and the California Hazardous Substance Account, seek injunctive relief for performance of response actions and reimbursement of response costs incurred by the United States Environmental Protection Agency ("EPA") and by the California Department of Toxic Substances Control ("DTSC"), pursuant to Sections 106 and 107 of CERCLA, 42 U.S.C. 9606, 9607, in response to releases of hazardous substances at the Operating Industries, Inc. ("OII") Superfund site in Monterey Park, California.

Under the proposed consent decree, the settling defendants have agreed to fund and perform future response actions at the OII Site. The consent decree also imposes obligations on, and provides benefits to Greenfield Monterey Park, LLC ("Greenfield"), an entity that intends to purchase a portion of the site for redevelopment purposes.

The consent decree requires the Owner/Operator Group, the City of Monterey Park and Southern California Edison to contribute approximately \$8.65 million to a trust that will be used to pay for past and future costs of remediating the site, and the Owner/Operator Group to pay \$3.1 million to the OII Custodial Trust, to be established for the purpose of receiving, holding and distributing funds in accordance with the provisions of the consent decree. If Greenfield purchases the Development Parcel it will conduct remedial action work valued at approximately \$6-\$7 million at the northern portion of the site and pay approximately \$3,633,000 to the Owner/Operator Group which, in turn, will deposit those funds into the OII Site Custodial Trust. The Generator Group will create and administer an escrow account, and conduct certain work valued at approximately \$850,000 at the